

National Agricultural Research, Extension, Education and Economics Advisory Board

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Focus Report: National Institute of Food and Agriculture's Agriculture and Food Research Initiative and Request for Applications

September 2010

Executive Summary

The National Agricultural Research, Extension, Education, and Economics (NAREEE) Advisory Board's Work Group developed this report as a result of the August 18, 2010 discussion with National Institute of Food and Agriculture (NIFA) leadership, and after a review of the public comments made to NIFA, and various other sources regarding the Agriculture and Food Research Initiative (AFRI) program as implemented in 2010. The report was reviewed and approved by the NAREEE Advisory Board members.

NIFA is to be commended for the scientific leadership, and for developing the Coordinated Agricultural Project approach to creating integrated projects to address critical national issues. The Foundation research grants to individual researchers are important to allow and encourage innovative ideas to be explored in depth but require more funding.

Significant increases in the total funding of USDA Research, Education, and Economics mission area, including but not limited to AFRI competitive grants, are needed. Unfortunately, the decision to shift congressionally directed programs and Section 406 Integrated Programs to fund the expansion of AFRI potentially erodes the future Congressional and industry support needed for these funding increases to become a reality.

A number of specific procedural issues created difficulties with the 2010 AFRI RFA, including the failure to consult with stakeholders in advance. In addition, many scientists narrowly interpreted the specifics under the challenge areas of the 2010 RFA, so extra care should be taken in writing the 2011 call of intent to allow a wider range of research subjects. There was also considerable concern about the shift in focus of the Foundation programs, which the Board believes should be expanded in scope and addressed in the future. Finally, an over-arching concern was that USDA stay committed to its unique research mission to maintain the productivity of American agriculture. This review by the NAREEE Advisory Board adds detail to these recommendations as well as listing some specific suggestions for needed research.

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The National Agricultural Research, Extension, Education, and Economics (NAREEE) Advisory Board's Executive Committee, and Work Group were pleased to meet with Dr. Roger Beachy, National Institute of Food and Agriculture (NIFA) Director and United States Department of Agriculture (USDA) Acting Chief Scientist, along with Dr. Deborah Sheely, NIFA Research Integrity Officer on August 18, 2010 to discuss the status of the NIFA programs and the Agricultural and Food Research Initiative (AFRI). The invitation by Dr. Beachy for the NAREEE Advisory Board to provide meaningful input on the AFRI program and its related Request for Applications (RFA) was welcomed.

The NAREEE Advisory Board's Work Group developed this report, and it was reviewed and approved by full Board, as a result of the August 18, 2010 discussion. In doing so, the NAREEE Advisory Board's Work Group conducted discussions with stakeholders and with their own group, and reviewed various public comments made to NIFA regarding the AFRI program in scheduled listening sessions, as well as a number of other publicly available sources of reactions to the NIFA AFRI program as implemented in the 2010 fiscal year.

NIFA is to be commended for the scientific leadership and visionary plan to increase its budget commensurate with other federal science agencies. Establishing a limited set of priorities on a focused agenda, and providing opportunities for larger and longer term grants have addressed some long standing concerns about USDA research. In addition, the decision to target major societal issues of broad public interest within these priorities can potentially increase the perceived value of research conducted by the USDA. Finally, the effort to further enhance innovative and impactful outcomes from the competitive research through NIFA has the potential to generate continued growth in funding and political support for agricultural research.

The approach introduced in the AFRI RFA in fiscal year 2010 replaces a system of competitive research grants under the National Research Initiative (NRI) used for over 20 years. Most of the research funding available through the NRI was described in well-defined disciplinary areas within the agricultural sciences and most of the available research funds were reserved for proposals

submitted by individual investigators. Although the total amount of funding was limited and the percentage of proposals funded was small (15-20%), the NRI system provided very clear direction on where researchers should submit proposals to ensure the highest probability of funding in contrast to the AFRI RFA.

Recommendations

Retain agricultural productivity as a high priority in NIFA research programs.

REE is the only federal entity charged with the viability of agriculture as its core mission. The needs for increased agricultural productivity are still strong as the world population grows and biomass crops compete with food crop, animal feed and fiber production. REE should strive to keep agricultural productivity as an important driver of its programs. The following topics should be considered:

- **Animal agriculture research is needed** not only on genomics but on animal welfare and environmental compliance. The decreasing emphasis placed by AFRI on this area should be reviewed, including the need to research animal diseases and food safety issues;
- **Replace the narrow focus on climate change** with broader language to capture the on-going needs for data on greenhouse gas sinks and emissions;
- **Support work related to climate change adaptation**, including evolving weed and pest control challenges emanating from climate change;
- **Pest management research is needed** to provide better insect and disease control, both exotic and endemic, since they continue to cause major problems in cropping systems;
- **Research on sensor and mechanization technology**, especially equipment innovations, will be critical to maintain U.S. agricultural productivity;
- **Increase emphasis on post-harvest** processing, handling, storage and distribution to ensure that a higher percentage of the productivity is converted into consumer products at affordable costs; and
- **Breeding programs focused on genomics and phenotyping** are priorities across both major and specialty agricultural crops. In particular, the US is well poised to lead an international effort designed to genotype all animal and plant microbial pathogens and establish a well-curated genotype library.

Adequately address research needs related to food quality, safety and security.

To meet the needs of the growing national and international demands on food supply the following items need to be addressed:

- **Food quality issues** require continuing research on the chemistry, microbiology and physical characteristics of foods to assure that the US is meeting domestic and international market demands. Basic mechanisms involved in the interaction of micro- and macro-molecules in the food matrix in controlling structure, texture, stability, and flavor delivery in foods are highly important. Additionally, processing, engineering, and quality enhancing technologies, coupled with chemistry and fates

of proven bioactive compounds in food and food ingredients during processing, packaging, storage, distribution, and delivery have a major impact on product marketability as well as on nutrition and human health;

- **Food safety challenges** require a coordinated approach among all sectors of the food system, but appropriate interventions depend on an understanding of the pathogens, the chemistry of reactions occurring within the product, and the development of intervention processes; and
- **Food security guidelines** were too narrowly drawn, focusing only on domestic issues with no opportunity for international research.

Increase transparency about acceptable subject matter for proposals.

A more definitive description of breadth of subject matter eligible for funding under priority initiatives or clarification that a specific proposal is merely an example is needed. The narrow description of the priority areas as reflected in the previous guidelines, while intended to be illustrative, was interpreted as very prescriptive. In a similar way, the topic areas identified under the Foundation Programs have been revised from the previous NRI in a manner that seems to eliminate the opportunities for many traditional research areas. Transparency of what is acceptable subject matter for research in the various priority areas needs to be significantly improved.

Increase funding for Foundation Grants.

The Coordinated Agricultural Project approach to creating integrated projects to address critical national issues of widespread interest is a good approach, though the management of these complex projects may create challenges. However, large multi-institutional projects across an array of scientific disciplines facilitate but do not necessarily guarantee breakthrough findings. The amount of funding for research grants to individual researchers has been reduced significantly, but is still important to allow innovative ideas to be pursued whether or not they fit into the established priorities. For example, concerns have been voiced indicating that the interface between food science and nutrition needs a strong emphasis on Foundation research to ensure that the impacts of diet on health, wellness and obesity are understood. Numerous organizations have voiced concerns that the priorities established in the 2010 AFRI call for proposals included very little funding for educational and social science programs. Funding for Foundation researchers is critical to ensuring that outcomes from fundamental research are available to feed into larger integrated projects in the future. The payoff from Foundation research can be tremendous, but not always easily fitted under established priorities.

Encourage communication and planning among REE agencies to make efficient use of resources and to maximize research impact.

It is critical that the unique research mission and capacity of USDA not be lost going forward while strengthening the competitive grants program of AFRI. The Agricultural Research Service and Economic Research Service programs, along with the important contributions of the National Agricultural Statistics Service to understanding the needs of agriculture and trends affecting it, must be kept in perspective with NIFA programs and coordinated with them. This suggests that those agencies need to be engaged in a reciprocal priority setting process with NIFA to assure that the total REE program has maximum return on investment and meets industry needs. Further, the stakeholder connections also need to be cultivated and incorporated into the planning process to maintain critical political support, especially as new sources of revenue are pursued.

Maintain strong relationships with constituents to ensure political support for increasing the budget.

The multi-year budget implications of the initial grants made in fiscal year 2010 are a concern. Under current federal budgetary constraints, attracting significant funding increases in future years to support additional large projects, while meeting ongoing funding commitments, will be a herculean task. This effort will be made politically more difficult if the traditional agricultural base and/or relevant scientific societies feel marginalized by the process or content of the competitive grant program. The shift of Congressionally directed and 406 Integrated Programs which addressed specific industry concerns to provide the source of funding increases for AFRI in the first year only reduces the potential support of those groups. The objective should be to simultaneously fund AFRI and support the USDA's other unique research missions to ensure the competitiveness of U.S. agriculture. This requires significantly increasing total REE funding, including but not limited to AFRI competitive grants. Finally, it would be helpful to demonstrate that stakeholder comments, including those of the NAREEE Advisory Board, are considered in the new RFA.

Assure that project review panels are scientifically representative, and have expertise in industry relevancy.

The NAREEE Advisory Board believes that panels should be selected to provide sound scientific evaluation based on an appropriate range of scientific expertise for the research areas being considered along with industry issues expertise, rather than being based on broader demographic considerations. If NIFA is encountering difficulty attracting panelists with the needed breadth of expertise, it might consider other options including the appointment of standing panels, as used by other science agencies.

Assure funding for project duration.

Since graduate students are funded almost entirely through research grants, students cannot be accepted into graduate programs unless the faculty advisor has grant funds for the entire time period of the degree. Principal Investigators for multi-year grants must be provided with reasonable assurance that funding will continue until research has been completed, assuming progress benchmarks are met.

Concluding Comments

These comments and recommendations address concerns identified in the 2010 NIFA RFAs, and should be considered in the 2011 RFAs. The NAREEE Advisory Board's observations and recommendations are based on a review of the comments from the various listening sessions, written comments, verbal communications with stakeholders, and Board deliberations. We have focused on the key concerns directly related to improving the 2011 RFAs. Broader issues will be addressed at future sessions of the NAREEE Advisory Board, and communicated in subsequent reports.

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